

## CLAIMS

What is claimed is:

- 1 1. A modular computer system comprising:  
2 a first component that generates data and publishes said data;  
3 a second component that registers to receive said data by issuing a request for said data;  
4 and  
5 an information kit that includes a plurality of nodes for communicatively connecting both  
6 said first component and said second component and that enables indirect communication  
7 exchange between said first component and said second component, wherein said information kit  
8 registers the request for said data and, when said data is published by said first component, the  
9 information kit provides a copy of said data to said second component.
- 1 2. The modular computer system of Claim 1, further comprising:  
2 a registration mechanism for registering said request for said data from said second  
3 component; and  
4 an information kit (IK) manager, associated with said information kit, that (1) identifies  
5 which data among multiple published data available on the information kit is a requested data by  
6 said second component and (2) determines when the data published by said first component is  
7 the requested data, wherein when the data published is the requested data, the IK manager  
8 provides said data to said second component, wherein only data which is a requested data is  
9 provided to said second component.
- 1 3. The modular computer system of Claim 1, wherein said request is packaged within an  
2 information kit subscription object that comprises an identifier (ID) of the requested data along  
3 with request parameters and a node ID for said second component.
- 1 4. The modular computer system of Claim 1, wherein said data is published within an  
2 information kit publication object that comprises an identifier (ID) of the data and parameters  
3 associated with the data and the published object.

1 5. The modular computer system of Claim 1, wherein said IK manager further comprises:  
2 a monitoring function that identifies when a publication object is placed on said  
3 information kit; and  
4 a notification mechanism that responds to a publication of the publication object on said  
5 information kit by:  
6 determining when an ID of the publication object matches an ID of a requested  
7 data; and  
8 notifying said second component of a presence on the information kit of said  
9 requested data.

1 6. The modular computer system of Claim 1, wherein said information kit further comprises  
2 a queue for storing published data, said queue having means for issuing the published data at a  
3 front of said queue to components that registered to receive the published data.

1 7. The modular computer system of Claim 6, further comprising means for arranging said  
2 published data according to some predefined criteria, wherein when said queue is a priority-  
3 based FIFO queue, said modular computer system further comprise:  
4 means for arranging published data within the queue, wherein published data having a same  
5 priority are issued in an order of entry into the queue while published data having a higher  
6 priority are published prior to published data with lower relative priority.

1 8. The modular computer system of Claim 1, further comprising:  
2 means for monitoring a level of freshness for a publication object on the information kit;  
3 means, when a freshness of said publication data is below a predetermined level, for  
4 triggering a publication of more current publication data from said first component;  
5 wherein said triggering occurs based on one of multiple triggering conditions from  
6 among: (1) said publication data is moved to a front of said queue to be issued out to said  
7 system; (2) said IK manager issues a refresh command with respect to the publication data; and  
8 (3) said publication object self-monitors its level of freshness and dynamically initiates a refresh  
9 operation; and

10 wherein published data of a stale publication object is discarded when a refresh operation  
11 provides a more current publication object.

1 9. The modular computer system of Claim 1, wherein generation and publication of said  
2 publication object is triggered by one of multiple triggers from among: (1) an expiration of a  
3 predefined interval tracked by said first component; (2) an expiration of a refresh period for a  
4 previously published object; (3) a notification received by said first component that a particular  
5 action has occurred on said system, wherein said action includes publication of another different  
6 publication object to said information kit.

1 10. The modular computer system of Claim 1, wherein said second component is an  
2 intelligent agent that receives a notification of a publication of the publication object and  
3 responds to said notification by completing a secondary function within said modular computer  
4 system.

1 11. The modular computer system of Claim 1, wherein said information kit further comprises  
2 multiple virtual nodes for expanding said modular computer system to include additional  
3 components.

1 12. In a modular computer system environment, a computer program product comprising:  
2 a computer readable medium; and  
3 program code on said computer readable medium for providing an application  
4 programming configuration for embedded device that enables independent component  
5 communications via object and expression protocols, said program code further comprising code  
6 for implementing an information kit that provides virtual nodes for connecting both a first  
7 subscribing component and a second publishing component and that enables indirect  
8 communication exchange between said first component and said second component, wherein  
9 said information kit registers the request for said data and, when said data is published by said  
10 first component to the information kit, the information kit provides a copy of said data to said  
11 second component.

1 13. The computer program product of Claim 12, further comprising program code for  
2 implementing:

3 a registration mechanism for registering said request for said data from said second  
4 component; and

5 an information kit (IK) manager, associated with said information kit, that (1) identifies  
6 which data among multiple published data on the information kit is a requested data by said  
7 second component and (2) determines when the data published by said first component is the  
8 requested data, wherein when the data published is the requested data, the IK manager provides  
9 said data to said second component, wherein only data which matches a requested data is  
10 provided to said second component.

1 14. The computer program product of Claim 12, further comprising program code for  
2 packaging said request as an information kit subscription object that comprises an identifier (ID)  
3 of the requested data along with request parameters and a node ID for said second component.

1 15. The computer program product of Claim 12, further comprising program code for  
2 publishing said data within an information kit publication object that comprises an identifier (ID)  
3 of the data and the value of the data.

1 16. The computer program product of Claim 15, wherein said program code for  
2 implementing said IK manager further comprises code for implementing:

3 a monitoring function that identifies when a publication object is placed on said  
4 information kit; and

5 a notification mechanism that responds to a publication of said publication object on said  
6 information kit by:

7 determining when an ID of said publication object matches the ID of said  
8 requested data; and

9 notifying said second component of a presence on the information kit of said  
10 requested data.

1 17. The computer program product of Claim 12, wherein said program code for  
2 implementing said information kit further comprises code for providing:

3 a queue for storing published data, said queue having means for arranging said published  
4 data according to some predefined criteria, and means for issuing the published data at a front of  
5 said queue to components that registered a request to receive said published data.

1 18. The computer program product of Claim 15, wherein said queue is a priority-based FIFO  
2 queue, and said program code for implementing said IK manager further comprises code for  
3 arranging published data within the queue, wherein published data having a same priority are  
4 issued in an order of entry into the queue while published data having a higher priority are  
5 published prior to published data with lower relative priority.

1 19. The computer program product of Claim 12, further comprising program code for:  
2 monitoring a level of freshness for a publication object on the information kit;  
3 triggering a publication of more current publication data from said first component, when  
4 a freshness of said publication data is below a predetermined level;  
5 wherein said triggering occurs based on one of multiple triggering conditions from  
6 among: (1) said publication data arrives at a front of said queue for issuing out to said system; (2)  
7 said IK manager issues a refresh command with respect to the publication data; and (3) said  
8 publication object self monitors its level of freshness and dynamically initiates a refresh  
9 operation; and

10 wherein published data of a stale publication object is discarded when a refresh operation  
11 provides a more current publication object.

1 20. The computer program product of Claim 12, wherein said program code includes code  
2 generating and publishing said publication object based one of multiple triggers from among: (1)  
3 an expiration of a predefined interval tracked by said first component; (2) an expiration of a  
4 refresh period for a previously published object; (3) a notification received by said first  
5 component that a particular action has occurred on said system, wherein said action includes  
6 publication of another publication object to said information kit.

1 21. The computer program product of Claim 12, wherein said second component is an  
2 intelligent agent and said program code includes code for receiving a notification of publication  
3 of the publication object and responding to said notification by completing a function within said  
4 modular computer system.

1 22. The computer program product system of Claim 12, wherein said program code for  
2 implementing said information kit further comprises code for providing multiple virtual nodes  
3 for expanding said modular computer system to include additional components.

1 23. In a modular computer system, an application programming configuration interface  
2 (APCI) for an embedded device that enables generic system-wide communicating for connected  
3 components, said APCI comprising:

4 a publish and subscribe software bus having an Information Kit (IK) manager and a  
5 plurality of nodes for communicatively connecting multiple components, including a first  
6 component that publishes information and a second component that subscribes for receipt of the  
7 information;

8 means for receiving a subscription object with a first pre-defined format recognized  
9 by said IK manager;

10 means for registering said subscription object, wherein a node of a subscribing  
11 component is tagged as registering interest in a particular published data;

12 means for receiving a publication object with a second pre-defined format recognized by  
13 said IK manager as a valid publication object;

14 means, wherein, when an identification (ID) of said publication object matches an ID  
15 provided within said subscription object, for forwarding said published data said subscribing  
16 component, wherein when there is more than one subscription component, said means includes  
17 means for completing a directed broadcast of said published data to each of said more than one  
18 subscription.